

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully request.

Claims 1-3, 8, 9, and 11-18 are presently active in this case. Claims 1-3, 12, and 13 have been amended and claims 14-18 have been added by the present amendment.

In the outstanding office action, Claim 3, 12-13 and 16-18 were objected to because the units of impedance appear to be incorrect; Claim 8 was rejected under 35 USC §112, 2nd para., as being indefinite; Claim 8 was rejected under 35 USC §102(b) as being anticipated by U.S. patent number 5,295,487 to Saitoh et al.; and Claims 1-3, 12-13 and 15-18 were rejected under 35 USC §103(a) as being unpatentable over U.S. patent number 6,049,159 to Barthe et al. in view of U.S. patent number 6,308,389 to Tezuka. However, Claim 9 was objected to as being dependent upon a rejected base claim, but was indicated as being allowable if rewritten in independent form, and Claim 11 was allowed.

Once again, Applicants acknowledge with appreciation the indication that Claim 9 includes allowable subject matter and the allowance of Claim 11.

In response to the objection to Claims 3, 12, 13 and 16 to 18, in each of these claims, the units "2MRayl to 10MRayl" have been amended to $-2 \times 10^6 \text{ g/m}^2$ to $10 \times 10^6 \text{ g/m}^2$ -. Accordingly, the objection to the units stated in these claims is believed to have been overcome.

In light of the renewed grounds for rejection on the merits, the claims have been amended to clarify the claim language and thereby more clearly patentably define over the cited prior art. To that end Claim 1 recites an ultrasonic vibration element comprising, inter alia, a lower resin layer which is formed on a lower surface of the piezoelectric member and which has smaller acoustic impedance than the piezoelectric member and --a cutting characteristic and electrical conductivity so as to function as an electrode, the lower surface

being an opposite side of an acoustically emitting side.-- Specifically, Claim 1 has been amended to avoid the terminology “excellent” which is a relative term, and to clarify that the lower resin layer is located at an opposite side of an acoustically emitting side. Similar changes have been made to other claims to identify the locations of particular layers serving as electrodes, and to avoid the relative term, “excellent”.

Each of Claims 2, 3, 12, 13 and 16-18 recites an ultrasonic probe comprising “a lower resin layer which is formed on a lower surface of the piezoelectric member and which has smaller acoustic impedance than the piezoelectric member, and a cutting characteristic and electrical conductivity so as to function as an electrode, the lower surface being an opposite side of an acoustically emitting side.”

Each of Claims 8, 9, 11 and 14 recites an ultrasonic probe comprising “a first electrode formed on a lower surface of each of the piezoelectric members, the lower surface being an opposite side of an acoustically emitting side; ... and a first flexible printed wiring board arranged between the first electrode and the backing member, includes a plurality of first pattern wires each having a width smaller than a width of each of the piezoelectric member in a longitudinal direction of the ultrasonic probe, extending in a longitudinal direction of each of the piezoelectric members and connected to the first electrode along the longitudinal direction of each of the piezoelectric members, and connects the plurality of pattern wires to an ultrasonic diagnosis apparatus body.”

No new matter has been added. Further, since the present amendment is clarifying in nature, it is believed that the present amendment clearly places the claims in better form for consideration on appeal. Accordingly, entry of this amendment under 37 CFR §1.116 is believed to be in order and is respectfully requested.

Turning now to the outstanding grounds for rejection on the merits, the outstanding rejection, and firstly considering the outstanding rejection of Claim 8 under 35 U. S. C

102(b), this ground for rejection appears to be based on the finding that Claim 8 lacks novelty because Saitoh et al. (FIG. 2, column 8, lines 43-59, and column 9, lines 22-56) discloses “a flexible printed wiring board 17 having a plurality of pattern wires.” Applicants respectfully traverse this finding on the basis that cited portions of the Saitoh et al. reference do not disclose “a flexible printed wiring board 17 having a plurality of pattern wires” and have no relevant description sufficient to support a rejection.

For example, each electrode 14 in FIG. 2 of Saitoh et al. has the same width as that of each piezoelectric member 11, and thus does not have the structure recited in Claim 8 (that is, the structure “includes a plurality of first pattern wires each having a width smaller than a width of each of the piezoelectric member in a longitudinal direction of the ultrasonic probe, extending in a longitudinal direction of each of the piezoelectric members and connected to the first electrode along the longitudinal direction of each of the piezoelectric members”). It is further pointed out that the flexible printed wiring board 17 of Saitoh et al. is separate from the electrodes 14 (note that the flexible printed wiring board 17 is separated from the electrodes 14 by a solid line in FIG. 2). Therefore, it is respectfully submitted that the structure of Claim 8 is not disclosed in Saitoh et al., and the outstanding rejection of Claim 8 is traversed on that basis. Reconsideration and allowance of Claim 8 is therefore respectfully requested.

With respect to the outstanding obviousness rejection under 35 USC §103(a), this ground for rejection appears to be based on the findings that,

(1) Barthe et al. discloses the claimed subject matter with the exception of the provision of a conductive resin used as the conductive material;

(2) Tezuka discloses a technique of forming the matching layer 14 of a conductive resin (epoxy filled with a silver frit) for electric connection with a piezoelectric member 2;
and

(3) the claimed invention is obvious over a combination of (1) and (2).

Applicants respectfully traverse this ground for rejection, in light of the amended claims, for the following reasons.

Generally, a matching layer is provided on an ultrasonic wave emitted side (that is, the upper side as stated in the amended claims) of a piezoelectric member. Assuming arguendo that it is possible to obtain a conductive upper electrode from the combination of Barthe et al. and Tezuka (that is, an idea of incorporating the matching layer with the upper electrode), it is respectfully submitted that the applied prior art still does not teach or obviate the matching layer can be incorporated with the lower electrode. The matching layer and the lower electrode are provided on opposite sides of the piezoelectric member, which is interposed therebetween. The above noted findings (1) and (2) do not support the conclusion that the combination of the references can achieve “a lower electrode having a conductivity” recited in the claims of the present application, where the lower surface on which the lower electrode is provided is an opposite side of an acoustically emitting side, even if it is assumed that the combination suggest “an upper electrode including a conductive resin.

Further, none of the references include disclosure concerning a lower electrode having conductivity, or a necessity of such a lower electrode. Therefore, the outstanding ground for rejection based on Barthe et al. and Tezuka is believed to be in error and is respectfully traversed. This is believed to be especially true when it is considered that the claimed invention achieves the non-obvious effect that “when the piezoelectric member is cut, the lower electrode having a conductivity protects the piezoelectric member, and prevents generation of chipping and cracks” by virtue of the presence of the lower electrode having a conductivity. Accordingly, reconsideration of the rejection based on Barthe et al. and Tezuka is believed to be in order and is respectfully requested.

Consequently, in view of the present amendment and in light of the above comments, no further issues are believed to be outstanding, and the present application is believed to be in condition for allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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